



Centers for Disease Control  
and Prevention (CDC)  
Atlanta GA 30333

TB Notes  
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Dear Colleague:

It is the time of year for us to review the tuberculosis (TB) cooperative agreement applications from state and local health departments, and staff in the Division of Tuberculosis Elimination (DTBE) are busy at this task. The fiscal year 1995 appropriation for TB grants totaled \$114,334,000, an increase of \$2,834,000, or about 2.5%, over last year's total. Although this increase will not be sufficient to cover all requests, we will be able to continue most of the priority program activities in the TB cooperative agreements. We now face the challenge of effectively using these resources to ensure that all TB patients complete treatment and that high-risk infected persons, particularly contacts and HIV-infected persons, are evaluated for and given preventive therapy. CDC's funding decision for each cooperative agreement will most likely be guided by the applicant's progress in achieving the objectives stated in the application. We pledge to continue our work with grantees to ensure the implementation and continuation of successful TB control programs.

We have recently produced several new training and educational materials for health care workers and patients. New or revised materials for clinicians include the *Core Curriculum on Tuberculosis* and the accompanying slide set; the *TB Care Guide*, a booklet for clinicians that presents highlights of the *Core Curriculum*; and *TB Treatment: A Clinical Guide*, a fold-out chart for clinicians that includes panels on TB treatment and medications. In addition, the revised *Improving Patient Adherence to Tuberculosis Treatment* is available. New materials for patients include *Questions and Answers about TB*, a 16-page booklet about TB transmission, the skin test, and treatment; *Stop TB!*, a poster describing transmission and pathogenesis; and a pad of tear-off sheets to accompany the *Stop TB!* poster. (See the New Publications section of this issue for more information.) To order copies of these materials, call the National Center for Prevention Services Voice Information System at (404) 639-1819.

The Advisory Council for the Elimination of Tuberculosis (ACET) convened on October 26-27 in Atlanta. The council began the meeting with a discussion of its mission and long-range priorities, followed by a review of the statements on screening, BCG vaccine, the essential components of a TB program, and TB control in correctional facilities. On the second day of the meeting, ACET members were brought up to date on the new infection control guidelines and the activities of the Workgroup on TB in Immigrants and Refugees. In addition, DTBE staff made presentations on 1994 surveillance trends, program management reports, and the Tuberculosis Information Management System.

DTBE staff recently attended the 1994 American Public Health Association (APHA) meeting in Washington, D.C. TB received a great deal of attention at the meeting; presentations were made on TB in homeless persons, TB screening in public schools in Los Angeles, TB in foreign-born vs. native-born persons in New York State, TB and managed care systems, and other topics related to TB. In addition, the 1994 Lillian Wald Service Award for public health nursing was presented to Sue Etkind, R.N., M.S., director of the Massachusetts TB program. Ms. Etkind was commended for her exemplary efforts, both local and national, to improve TB treatment and control, as well as for her support of public health nursing in disease control. We are delighted that Ms. Etkind received this honor, and we extend our congratulations.

I would like to remind those of you who communicate with us via WONDER that DTBE is required to save all e-mails in a back-up storage file. These stored e-mails are accessible to anyone requesting information under the Freedom of Information Act. Therefore, patient identifiers should not be included in e-mails. This is crucial for maintaining confidentiality.

Many of you will be coming to Atlanta in January to attend the 1995 national TB controllers workshop. We hope that this will be a productive meeting for TB controllers, and we look forward to seeing you then.

Kenneth G. Castro, M.D.

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NOTE: The use of trade names in this issue is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

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## HIGHLIGHTS FROM STATE AND LOCAL PROGRAMS

## Mobile X-ray Screening in Los Angeles

The homeless population in Los Angeles County is one of the largest in the country, with an estimated 70,000 to 100,000 homeless persons on any given day. In 1993, 238 cases of TB were confirmed in homeless persons; more than half of the cases occurred in central Los Angeles.

Although the Los Angeles County TB program uses outreach services and food and housing incentives to help homeless TB patients complete treatment, more work is needed to find homeless persons who have TB and need treatment. In many instances, homeless persons are not found to have TB until they have had the disease for some time and have gone to a hospital emergency room. To find TB cases earlier in the disease process, reduce transmission, and improve treatment for potential patients, the Los Angeles County TB program has initiated mobile x-ray screening in areas frequented by homeless persons.

A completely equipped, mobile x-ray unit is being leased. Films are taken and read immediately on-site; persons with abnormal

findings are transferred to a medical facility right away. Homeless persons who agree to be screened are offered a fanny pack containing socks, a toothbrush, toothpaste, soap, and a razor. This fanny pack has proven to be amazingly effective as an incentive.

Since August 15, 1994, 26 screenings have been conducted with the mobile x-ray unit. The first six screenings were done in cooperation with the Los Angeles Cold/Wet Weather Emergency Shelter Program. Subsequent screenings were done in missions, shelters, and drop-in centers of service providers for homeless persons in the downtown/Skid Row area, Hollywood, and the Santa Monica/Venice Beach areas.

A total of 2766 persons have been screened as of September 15, 1994. Of these persons, 152 had abnormal x-ray findings. Abnormalities were varied. Some were TB related, indicating possible active or previous disease; others were not related to TB, indicating cardiomegaly, bronchiectasis, or small nodular growths.

Of the 152 persons with abnormal findings, 115 had initial findings suggestive of TB. Many had been previously treated for TB, but 14 persons were confirmed to have new TB cases. In addition, eight persons are suspected of having TB and are receiving therapy pending

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confirmation. During a contact investigation for one of the new cases, two additional confirmed cases were found.

Persons with abnormal findings not consistent with TB were encouraged to seek follow-up medical care through a primary care facility located in the downtown/Skid Row area or through the county hospital system.

*—Reported by Paul T. Davidson, MD  
Graydon Sheperd  
Stuart McMullen  
Los Angeles County TB program*

### **A New Threat to TB Control Efforts in Oregon**

A recent outbreak of TB in Oregon highlights a rising threat to local TB control efforts: drug abuse, especially drug injection. A Portland resident with a history of using crack cocaine was found to have highly infectious TB. She denied having any contacts, except for her immediate family. Of 16 family members evaluated, 12 were infected, including 3 who had TB disease.

Alarming, 11 TB cases and 20 infected persons have been epidemiologically linked to the patient since November 1993. Most of the affected persons were not mentioned as contacts by the source patient. Of the 11 cases, 5 were in children (2 school-aged children and 3 preschoolers). Of the persons with TB infection but no disease, most were found during routine skin test screening at the county jails, a methadone maintenance clinic, and the

county detoxification center. These persons cited their contact with the source patient as their only known exposure to TB; in most instances, the exposure was brief.

Because of the large number of contacts with TB disease or infection, TB program staff continue trying to reach other potential contacts. They have notified the medical community, promoted screening through cable television shows, and worked closely with community-based organizations serving the affected community.

The community is experiencing ripple effects from this very infectious case. The outbreak has involved several institutional settings, including a drug rehabilitation center, the county jails, several homeless shelters, one middle school, and one high school. Incidentally, the source patient in this outbreak has been epidemiologically linked to a person who injected drugs, who was found to have TB 2 years ago, and who also denied having any contacts.

This story is reminiscent of one told in San Francisco,<sup>1</sup> where according to a recent study, a single, highly infectious TB patient accounted for a significant proportion of the TB cases reported during the study period. Another important finding of this study was that during the study period, conventional contact tracing found only 10% of the city's TB patients who were considered recently infected.

Clearly, expanded outreach services and new methods of case finding are

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crucial among certain high-risk groups in Oregon. Persons who inject drugs are at increased risk for TB, especially as their risk for HIV infection continues to rise faster than among other groups in Oregon.

*—Reported by Beth Brown  
Mary Ann Hawley  
Oregon TB program  
and Gary Oxman, MD  
Multnomah County Health Department*

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#### Reference

1. Small PM, Hopewell PC, Singh SP, et al. The epidemiology of tuberculosis in San Francisco. *N Engl J Med.* 1994;330:1703-1709.

### **DTBE Surveys Evaluation Activities of TB Control Programs**

Because the evaluation of program activities is crucial to the effective use of resources, DTBE would like to assist state and local TB programs in developing their capacity for evaluation. Recently, staff in the Prevention Effectiveness Studies Unit surveyed TB programs to determine the scope of their evaluation activities. In particular, DTBE staff wanted to determine the current evaluation activities of state and big-city TB control programs, as well as the information systems that programs use for evaluation. Also, DTBE staff wanted to assess the needs of TB programs for improving their capacity for evaluation.

In early January 1994, a questionnaire was mailed to 68 TB control programs: all 50 states, 9 metropolitan areas, the District of Columbia, and 8 U.S. territories. The metropolitan areas were Baltimore, Chicago, Detroit, Houston, Los Angeles, New York City, Philadelphia, San Diego, and San Francisco; the U.S. territories were American Samoa, Guam, Marshall Islands, Micronesia, Northern Mariana Islands, Palau, Puerto Rico, and the Virgin Islands.

The survey included questions on the use of information systems for evaluation; patient treatment and case management; outreach activities; screening and preventive therapy

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activities; experience performing cost analyses; and requests for training. A total of 62 programs (91%) responded to the questionnaire.

#### Surveillance

Of the 62 programs, 57 (92%) reported using CDC's Software for Expanded Tuberculosis Surveillance (SURVS-TB) to report verified TB cases to CDC. (SURVS-TB was originally distributed to 53 programs — 50 states, New York City, District of Columbia, and Puerto Rico. Programs that reported not using SURVS-TB had not been given the software.) Data available in SURVS-TB include initial and final drug susceptibility results, sputum conversion, the use of directly observed therapy (DOT), and the reason for stopping therapy. These data can be used to evaluate the outcomes of therapy for TB. By using the report-generating functions and data export capabilities in SURVS-TB, TB programs can analyze surveillance data locally for the first time.

#### Patient Treatment and Case Management

Of 47 programs responding to questions on this topic, 16 reported that their urgent need was computer software for case and program management. In fact, 18 of 44 programs specifically requested that CDC provide this software. CDC is currently developing a software package that will contain program management, individual case management, and surveillance reporting capabilities — the

Tuberculosis Information Management System (TIMS). TIMS will include detailed demographic and clinical information on individual patients, expanding on the Program Management Report indices that allowed for the analysis of aggregate data only. Once TIMS is implemented, it will facilitate evaluation activities at the program level. For example, programs will be able to analyze treatment and preventive

therapy completion rates for patients, as well as the extent of contact investigations, by a variety of demographic variables.

#### Outreach Activities

There is evidence that TB programs are using supervised therapy with an increasing number of patients and that they are attempting to evaluate their supervised therapy programs, as well as other components of their outreach activities. Of 30 programs that provided information on this topic, 19 reported evaluating their outreach activities through process evaluation, and 19 reported evaluating their outreach workers through outcome evaluation (Table 1).

#### Screening Activities

TB programs noted difficulties in evaluating screening activities, particularly those performed by agencies outside the health department. Among the difficulties cited were the lack of a reporting system (17 programs), no staff or time to tabulate results (9 programs), no mandate for reporting (7 programs), and confidentiality issues (5 programs). A screening component will be included in TIMS in order to facilitate the analysis of health department screening activities.

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**Table 1**  
**Methods of Evaluating Outreach Activities**

<b><u>Process Evaluation</u></b>	<b><u>No. of Programs Using this Method† (n=30)</u></b>
Number of patient visits per month	14
Number of patients receiving DOT	8
Number of contacts found and examined	5
Any of the above	19
<b><u>Outcome Evaluation</u></b>	
Number of patients that completed treatment	17
Number of patients with sputum conversions	7
Number of patients that completed preventive therapy	6
Any of the above	19

### Economic Analyses

Economic analyses can be useful in linking expenditures to program outcomes and in directing policy and the use of funds. However, obtaining data on costs of goods and services can be quite difficult. More than 50% of the TB control programs reported that it would be possible to obtain cost data for drugs, laboratory and radiologic procedures, but less than 50% of the programs reported being able to obtain cost data on the provision of services, e.g., performing contact investigations (Table 2). The difficulties cited in obtaining cost data include ascribing costs to specific services (16 programs), no time or staff (9 programs), no

standard method for data collection (9 programs), and variations in costs (5 programs). Yet 45% of the programs had done some type of cost assessment, such as evaluating the cost per case cured (18 programs), cost-effectiveness (16 programs), or cost per case prevented (11 programs).

### Summary of Findings

The principal needs reported by TB programs regarding evaluation were for computer software for case and program management and training in evaluation and economic analysis. Currently, DTBE is working to address these issues.

*—Reported by Nilka Ríos, MT, MPH  
Division of TB Elimination*

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**Table 2**  
**Cost Data Available to TB Programs for Evaluation**

<b><u>Cost Data Available</u></b>	<b><u>No. of Programs† (%)</u></b> (n=62)
Drugs for treatment and preventive therapy	50 (81)
Sputum for AFB culture	49 (79)
Drug susceptibility testing	43 (69)
Chest radiograph and interpretation	36 (58)
Hospitalization	28 (45)
Provision of directly observed therapy	27 (44)
Skin test administration and reading	27 (44)
Outpatient treatment for drug-susceptible case	26 (42)

## **Tuberculin Products to Be Compared in DTBE Studies**

In the United States, the tuberculin skin test is the only commercially available method of detecting latent infection with *Mycobacterium tuberculosis*. Although the tuberculin skin test with purified protein derivative (PPD) has remained superior to alternative methods that detect latent infection, its sensitivity and specificity are less than 95%. Also, variations in testing practices and in the PPD reagent can lead to false-positive or false-negative results. Since 1988, the Food and Drug Administration (FDA) has collected reports of 853 persons who had suspected false-positive skin test results, and two reports of possible clusters of false-positive results have been published.<sup>1,2</sup>

The Clinical Research Branch and the Surveillance and Epidemiologic Investigations Branch, DTBE, are starting studies to determine whether the two commercially available PPD tuberculin reagents, Aplisol® (Parke-Davis) and Tubersol® (Connaught Laboratories, Ltd.), have appropriate specificity and sensitivity. The studies will be done in two phases: in the first phase, culture-confirmed TB patients will be tested with both PPD reagents to determine whether each reagent produces the predicted reaction, and in the second, populations likely to have a low prevalence of latent *M. tuberculosis* infection will be tested with both reagents to estimate the specificity of each reagent. These studies are scheduled to begin in December 1994.

Suspected problems with PPD skin test reagents should be reported to MedWatch, the FDA medical products reporting program.

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Instructions are on FDA Form 3500, located on the last page of the 1994 *Physicians' Desk Reference*.<sup>3</sup>

—Reported by John Jereb, MD  
Division of TB Elimination

#### References

1. Lifson AR, Watters JK, Thompson S, Crane CM, Wise F. Discrepancies in tuberculin skin test results with two commercial products in a population of intravenous drug users. *J Infect Dis.* 1993;168:1048-1051.
2. Rupp ME, Schultz AW, Davis JC. Discordance between tuberculin skin test results with two commercial purified protein derivative preparations. *J Infect Dis.* 1994;169:1174-1175. Letter.
3. *Physicians' Desk Reference*. Medical Economics Data Production Company: Montvale, NJ; 1994.

### The Elements of Successful Case Management Programs

On August 1, 1994, staff of several state health departments participated in a program management telephone conference sponsored by the Association of State and Territorial Health Officials, the Public Health Foundation, and CDC's Public Health Training Network. This conference, entitled Keys to Making Tuberculosis Case Management Programs Work, was moderated by Lloyd Novick, MD,

MPH, director of the Center for Community Health, New York State Department of Health. Panelists included Susan J. Klein, MS, associate director of the Division of Epidemiology, Center for Community Health, New York State Department of Health, and Gisela F. Schecter, MD, MPH, director of the San Francisco TB control program. A total of 107 people from 24 agencies participated in the discussion.

Ms. Klein's presentation was entitled Creating a Provider Network: Mobilizing Nontraditional Directly Observed Therapy Providers.\* This presentation described New York State's new approach to ensuring the completion of therapy. In a special report, state legislators recognized that New York's growing TB problem required new strategies and that "noncompliant patients pose the biggest challenge in TB care." In response, a law was passed in July 1991 authorizing the creation of programs to facilitate the completion of therapy; the programs would be funded through a portion of the existing state Medicaid budget. In New York City, this effort has included the provision of directly observed therapy (DOT) through organizations already serving high-risk, hard-to-reach individuals (e.g., hospitals, outpatient clinics, neighborhood health centers, AIDS centers, or substance abuse treatment centers). Payment for DOT programs is provided through Medicaid and other reimbursement programs, using two different levels of reimbursement (depending on whether the patient was already receiving care

for another medical problem) and through special grants to providers.

The overall plan for this approach includes

- Integrating DOT into the ongoing activities of providers serving at-risk clients
- Referring individuals to DOT programs before they are discharged from the hospital
- Offering DOT either in a clinic or in a community-based site
- Using trained, but not licensed, community members as outreach and DOT workers

- Developing payment systems that include patient incentives
- Ensuring close coordination with the local health department

A total of 22 providers representing more than 70 sites of service and outreach have developed programs under this statewide initiative, including chest clinics (now serving more than 50% of TB patients), private and public hospitals (serving more than 40% of TB patients), and clinics, shelters, and methadone maintenance and treatment programs (serving the remainder of TB patients).

Ms. Klein described the following basic program elements used by DOT providers in New York City:

- Observing patients as they ingest TB medications
- Using incentives to reward patients for successful adherence to therapy
- Doing community outreach (providing DOT and locating patients who miss appointments)
- Sending reminders to patients and helping them keep follow-up appointments
- Referring patients who are difficult to serve or who regularly miss DOT appointments to the health department for intensive outreach
- Communicating relevant information to the health department

The state's initiative has been successful thus far at establishing a network of providers, hospital discharge planners, and third-party payers to

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establish and support comprehensive DOT programs. The estimated overall compliance across the provider network is 80%. In addition, the DOT program of the New York City health department has been expanded, and increasing numbers of patients are receiving DOT. The policy of both New York State and New York City is to make DOT the standard of care for all TB patients, and steps are being taken to ensure the high quality of DOT programs.

Dr. Schechter's presentation was entitled Using Self-Administered Therapy. Dr. Schechter has found that self-administered therapy (SAT) is less labor intensive than DOT and can be successful if patients are selected appropriately and adequate monitoring is used. Approximately 75% of patients in San Francisco are assigned to SAT (the other 25% receive DOT), and the overall completion of therapy rate is approximately 95%. The San Francisco program treats a large number of newly arrived foreign-born persons who have jobs; for patients who work, SAT can be more convenient than DOT, which requires that patients come to clinic or that an outreach worker be allowed to visit the patient's job site frequently.

The San Francisco program has found that, in order to be successful, SAT must involve

- Consistent and accurate patient education (adapted to the patient's linguistic and cultural background)
- Regular monitoring for potential drug toxicity and for nonadherence (by pill

counts, interviews, and urine tests, and by uric acid levels if PZA is used)

- Regular monitoring for response to treatment (by monthly sputum smears and cultures until the patient is bacteriologically negative or by clinical response if the patient has extrapulmonary TB)
- A home visit to identify unreported contacts and possible barriers to compliance and to educate household members about TB

- Exclusion criteria for SAT, such as homelessness, abuse of alcohol or other drugs, dementia or psychosis, a history of poor compliance and failed treatment, and multidrug-resistant TB. Patients with these conditions, as well as adolescent patients, are considered at high risk for nonadherence.

Patients who continue to have positive cultures after 2 months of treatment should be considered for DOT, because this failure to convert to negative may indicate sporadic compliance or drug resistance.

Participants appreciated this opportunity to share ideas and information between programs, and a second teleconference with the same panelists is being planned for this winter. If you are involved in case management and would like to participate in the second teleconference, fax your name and telephone number to Rita Kelliher, Public Health Foundation, at (202) 898-5609. For more information, call Ms. Kelliher at (202) 898-5600.

*—Reported by Susan Graham, MPH  
Division of TB Elimination*

\* An article on the New York State DOT Providers' Network Program will soon be published in the *Journal of Community Health*.

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## **Communication and TB Control: The Power of Nurses**

*The following article is based on an editorial published in the July/August 1994 issue of The American Nurse.*

The highest priority of TB control in the United States is to identify all persons who have TB disease and to cure them. Because providing complete treatment to TB patients requires long-term outpatient care, communication is essential among the health care workers who serve these patients. A lapse in communication can have serious consequences: additional persons exposed to TB, patients lost to follow-up before completing therapy, patients rehospitalized with infectious TB, and patients developing multidrug-resistant TB because of inadequate therapy. Brudney and Dobkin<sup>1</sup> examined the treatment outcomes of 224 TB patients admitted in 1988 to Harlem Hospital in New York City. Of 178 TB patients discharged from the hospital, 89% failed to complete treatment; 56% received no follow-up treatment after discharge. More than one fourth were readmitted with confirmed TB disease in less than 12 months, and nearly 88% of those readmitted were lost again. Effective communication can help prevent such treatment failures.

Nurses make significant contributions to controlling TB. For nurses, goals include promptly finding TB cases, administering medication, ensuring the

completion of therapy, and providing follow-up to persons exposed to TB. The following model highlights the role of effective communication among nurses, primarily during the hospitalization of a TB patient or suspect. Because the duties of nurses and other health care workers vary from area to area, this article is intended to present a model for communication, not to recommend specific duties and functions for nurses.

- When staff nurses admit patients, they should help find TB cases by being alert for TB symptoms, questioning patients about TB risk factors, and requesting screening for persons who may have infectious but undiagnosed TB. They should also identify barriers to a patient's completing therapy such as a lack of social support, housing, or transportation; substance abuse; or mistrust of medical treatment. They should look for evidence of denial of illness. Immediately after admitting the patient, they should communicate with other key nurses — the TB public health nurse or TB supervisor, the discharge planner, and the infection control nurse — about the diagnosis, identification and location information, and possible barriers to treatment adherence. Immediately notifying the health department is essential.
- When public health nurses receive a referral, they or a designated health care worker should visit the patient in the hospital to review the

treatment plan, develop the adherence plan, and obtain contact information. The treatment plan includes the details of the medical regimen as ordered by the physician, as well as plans for monitoring and follow-up. The adherence plan should be developed by the nurse or TB supervisor with input from the patient and other providers. This plan should be based on the patient's understanding and acceptance of the TB diagnosis, and it must address barriers to completing therapy. Adherence often improves if the patient, the family (if possible), and the nurse develop a contract that describes the treatment plan and states the responsibilities of the patient and the health care worker. The public health nurse should communicate with the staff nurse and the discharge planner to obtain information about test results, relevant medical history, potential adverse drug reactions, and the status of plans to address adherence barriers.

- When a patient may have been infectious, the public health nurse or a designated health care worker should initiate a contact investigation to identify persons exposed to the patient outside the hospital and to arrange for tuberculin testing and evaluation. The public health nurse or health care worker should communicate with the infection control nurse to determine the

patient's infectiousness.

- Upon receiving a referral, discharge planning nurses should make arrangements to ensure that the TB patient is monitored after discharge so that drug therapy is continuous. To prevent lapses in care, they should coordinate discharge referrals for all TB patients and communicate with the public health nurse or case supervisor about these plans. They should arrange services that will help patients complete treatment (for example, safe and stable housing during TB therapy or admission to a substance abuse treatment program). They may need to refer the patient for social services to help acquire food, transportation, or employment. Discharge planners should communicate with the public health nurse or case supervisor about progress in obtaining these services.
  - When a patient is suspected of having TB, infection control nurses should decide whether TB exposure may have occurred in the hospital by tracing the patient's movements and activities before isolation and the initiation of therapy. They should report exposed persons to the employee health nurse and monitor screening and follow-up results of employees and exposed patients. If avoidable transmission has occurred in the hospital, they should take steps to strengthen infection control policies and procedures to prevent future
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exposure. The infection control nurse should also ensure that the patient has been reported to the health department.

- When hospital employee health nurses receive the names of staff and patients who were exposed to TB, they should skin test the exposed individuals and report the results to the infection control nurse. In addition, they should conduct an ongoing skin test program to determine whether TB is being transmitted in the facility and to identify infected health care workers who may benefit from preventive therapy.

In summary, nurses in a variety of settings provide vital TB control services. Effective communication among nurses is important for ensuring that TB transmission is interrupted, that TB patients complete treatment, and, ultimately, that TB morbidity is reduced in the United States.

*—Reported by Judy Daugherty-Gibson, RN  
Division of TB Elimination*

#### Reference

1. Brudney K, Dobkin J. Resurgent tuberculosis in New York City. *Am Rev Respir Dis*. 1991;144:745-749.

## **Study of the Hospitalization of TB Patients**

The Prevention Effectiveness Studies Unit, DTBE, has initiated a study of the hospitalization of TB patients. This study is intended as a follow-up to a 1993 study by the National Multidrug-Resistant TB Task Force, in which hospitalizations were found to account for the largest portion of expenditures for TB in 1991. In fact, in 1991 estimated inpatient treatment accounted for 62% of all the identified direct expenditures for TB, whereas outpatient treatment accounted for 26%. Contact follow-up, preventive therapy, and screening accounted for the remaining 12%.

The study of the hospitalization of TB patients will be done prospectively to determine the rate of hospitalizations for persons with active TB; the indications, lengths of stay, and costs of these hospitalizations; and the impact of HIV and multidrug-resistant TB on hospitalization and costs. Nine TB programs (Chicago, Georgia, Los Angeles County, Mississippi, San Diego County, San Francisco, South Carolina, Texas, and New York State) have been selected to conduct the study. These sites will enroll a maximum of 200 TB patients (reportable cases only) for 6 consecutive months and will follow them until they complete therapy, to a maximum of 36 months.

With ongoing constraints on funding at all levels for TB control, it is critical that we evaluate all expenditures and

identify optimal methods to achieve the goals of treatment, prevention, and the eventual elimination of TB. Hopefully, the results of this study will assist programs and communities in planning their needs for hospitalization, which may vary according to the rates of TB, multidrug-resistant TB, and HIV infection in the community. In addition, this study may help demonstrate the need for cost-saving alternative methods of supervising treatment for TB patients such as directly observed therapy, TB units in homeless shelters, or TB units in supervised single-room occupancy hotels.

*—Reported by Nilka Ríos, MT, MPH  
Division of TB Elimination*

## **Temporary Duty Assignments of TB Public Health Advisors**

Public health advisors assigned by DTBE to state and local health departments play important roles in the operation and management of many TB programs in the United States. As of October 1, 1994, the field staff included 48 public health advisors assigned to 22 states and 9 major metropolitan areas. In addition, there are 10 public health advisor trainees (public health associates) working in the New York City TB program.

From time to time, field as well as headquarters public health advisors are temporarily detailed from their permanent duty station to another location to participate in a program review, assist with an outbreak

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investigation, provide management assistance, or meet other TB program needs. Some are also called on for domestic and international assignments in other public health programs. During the past year, eight public health advisors have been involved in temporary duty assignments.

Andy Heetderks, who was assigned to the Bureau of Tuberculosis, New York City Department of Health, was a member of a four-person CDC team assembled by the International Health Program Office and assigned to Armenia in June 1993 for 6 weeks. Working with the United Nations High Commissioner for Refugees, the team developed and implemented a survey of the nutritional status of ethnic Armenians who had been displaced from Azerbaijan. In August 1993, Andy was transferred from New York City to DTBE in Atlanta, where he now works as the program consultant for Regions VII and VIII.

In July 1993, Candice Jackson, who is assigned to the Tuberculosis Control Branch of the North Carolina Department of Environment, Health, and Natural Resources, was assigned to Iowa for 30 days. This detail was arranged in cooperation with the Emergency Response Coordination Group, National Center for Environmental Health, as part of CDC's response to the 1993 floods in the midwest. Candice helped manage local TB program operations in areas of the state heavily affected by the floods.

Carla Lee, whose permanent assignment is to the TB program of the Chicago Department of Health, was detailed to Maryland in October 1993 for 1 week and again in December 1993 for 1 week to assist state and local public health officials and other CDC staff in investigating an outbreak of TB. Carla was responsible for helping coordinate and evaluate the logistics of the investigation.

In January 1994, Gus Aquino, who was assigned to the Bureau of Tuberculosis, New York City Department of Health, was temporarily detailed to Kansas for 3 weeks to assist state and local health department staff in setting up systems to ensure continued treatment, monitoring, and follow-up for patients and contacts involved in an outbreak of TB. In May, Gus was transferred from New York City to the TB program of the New Jersey Department of Health.

Louis Salinas, DTBE program consultant for Region II, was assigned to Luanda, Angola, in May 1994 for 4 weeks. He participated in an International Health Program Office consultation to assist the Angola Ministry of Health and the United Nations International Children's Education Fund (UNICEF) in developing an emergency sentinel disease surveillance and reporting system. A major focus of his work was to build capacity to ensure that the surveillance system would be continued in this country when CDC technical assistance ends. Louis was also a member of a World Health Organization

team that reviewed the TB program in Brazil from July 4-15, 1994. His work took him to Rio de Janeiro and Brasilia.

Angela Bauer of New York City and Ellen Knowland of Los Angeles were assigned to Georgia on details arranged in cooperation with the Emergency Response Coordination Group, National Center for Environmental Health, as part of CDC's response to the 1994 floods in South Georgia. Angela worked in Columbus from July 21 to August 12. Her responsibilities included collecting data for the surveillance of flood-related injuries. Ellen was assigned to Albany from July 28 to August 12. She also worked on injury surveillance activities.

James Enns, who is assigned to New York City, was selected for a temporary detail to Arkansas from August 15 to September 2, 1994. He worked with a DTBE team consisting of an Epidemiologic Intelligence Service (EIS) officer, a public health advisor, and a nurse to collect epidemiologic data for a study of community TB transmission and restriction fragment length polymorphism (RFLP) analysis.

Temporary duty assignments of public health advisors are a very important part of our commitment to state and local TB programs and to other domestic and international public health activities. We are always grateful for the spirit of cooperation we receive from officials at the employees' permanent duty stations when we propose to temporarily assign DTBE field staff to

another location.

—Reported by Mack Anders  
Division of TB Elimination

## NEWS BRIEFS

- There is an error in the Summer 1994 issue of *TB Notes*. On page 11, in the question for Stump the Experts, CDC guidelines for rifabutin prophylaxis for disseminated *Mycobacterium avium* complex (MAC) in HIV-infected persons are quoted incorrectly. CDC currently recommends that rifabutin prophylaxis be considered for HIV-infected persons with CD4<sup>+</sup> T-lymphocyte counts of  $\leq 100$  cells/ $\mu$ L, not  $\leq 200$  cells/ $\mu$ L.
  - DTBE will host a national TB controllers workshop from January 8-11, 1995, in Atlanta. The workshop, entitled Teamwork for TB Elimination Priorities: Completing Therapy and Interrupting Transmission, is for TB controllers, nurse consultants, and program managers from state, territorial and big-city TB programs awarded CDC cooperative agreements. An announcement of the workshop was mailed to potential participants in September.
  - DTBE staff are designing a series of five self-study educational modules on TB. The modules focus on transmission and pathogenesis, epidemiology, diagnosis, treatment,
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and infection control. The target audience is public health workers with little or no background in TB — for example, newly hired outreach workers in TB programs or staff of sexually transmitted disease programs, correctional facilities, drug treatment centers, migrant clinics, nursing homes, homeless shelters, or other high-risk facilities. Students who complete the modules will be able to take a multiple-choice test for continuing education credit. The modules have been field tested in Atlanta and New York, and are currently being field tested in various sites throughout the country. Publication is scheduled for February 1995.

- Rifampin may render contraceptive implants (e.g., Norplant) and other hormonal contraceptives ineffective because it accelerates estrogen metabolism. Women using hormonal contraceptives should be advised to use another method of birth control while taking rifampin.

## STUMP THE EXPERTS

Q: In some pharmacies, patients picking up prescriptions for isoniazid have received information sheets warning them against eating cheese or drinking red wine while taking isoniazid. Is there any evidence of a connection between this drug and adverse reactions to cheese?

A: Yes, but these reactions are rare. Isoniazid is closely related to a

group of drugs called monoamine oxidase inhibitors. These drugs, often used to treat depression, inhibit the body's production of an enzyme called monoamine oxidase. Without this enzyme, the body cannot metabolize monoamines, substances found in cheese, red wine, and other foods. The result is an abnormally high concentration of tyramine, a type of monoamine, in the bloodstream. This overabundance of tyramine causes hypertension. Patients with hypertensive reactions may experience flushing, headaches, palpitations, chills, and elevated heart rate and blood pressure.

Hypertensive reactions to cheese are rare in patients taking isoniazid. However, patients who report having symptoms of hypertension after eating cheese (or other monoamine-rich foods) should be advised to avoid these foods while taking isoniazid. After therapy is completed, patients should be able to eat these foods again without any problems.

—Reported by Pattie Simone, MD  
Division of TB Elimination

## BEHAVIORAL SCIENCE NOTES

**Behavioral Science Conference  
Held in Bethesda**

From August 28 to 30, 1994, DTBE

cosponsored a workshop in Bethesda, Maryland, with the goal of establishing an agenda for research on the major behavioral, social, and health services aspects of TB treatment, prevention, and control. The meeting was chaired by Esther Sumartojo, PhD, from DTBE and Alan Trachtenberg, MD, MPH, from the National Institute on Drug Abuse, National Institutes of Health (NIH).

It was an interagency meeting, with sponsorship and representatives from several of the institutes of NIH and from the Health Resources and Services Administration. Participants included TB controllers and specialists, physicians, nurses, behavioral and social scientists, health educators, and public information specialists. Most of the 66 workshop participants were providers from TB treatment programs, academic researchers from the medical and behavioral sciences, and representatives from community organizations and from the government.

The agenda included plenary presentations from Alan Hinman, MD, MPH, on the role of behavioral science in TB prevention and control, and from Ken Castro, MD, on the current epidemiology of TB. Jacqueline Dunbar-Jacob, PhD, RN, FAAN, a nurse and psychologist from the University of Pittsburgh, drew from her own research on patient adherence to discuss the role of behavioral theory in health behavior.

Workgroups prepared recommendations for research in five

areas. The workgroup on enhancing public knowledge and prevention behaviors recommended basic research to define the level of the public's knowledge about TB; explore how that knowledge is influenced by socioeconomic, race, or ethnicity; and identify the most efficient channels for communicating TB information to targeted groups. Among other recommendations were studies of educational strategies to link at-risk persons to appropriate medical services and studies of interventions such as social marketing to encourage persons at risk for TB to seek health care.

The workgroup on improving provider practice behaviors agreed that "providers" must include physicians, nurses, allied health professionals, clinic or hospital staff, and nonmedical staff such as human service or corrections workers. The workgroup also agreed that provider behavior is influenced by a complex system of factors, and that research is needed on the best methods for education or continuing education of providers, on training providers to use up-to-date technology in patient management, and on methods for changing provider behaviors and increasing their use of effective interpersonal skills in patient management.

The workgroup devoted to improving the quality of service systems recommended research on the impact of the changing TB infrastructure on patient services, measures of the effectiveness of the service delivery

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system, economic studies of TB prevention and control strategies, and studies of strategies to ensure that patients receive continuous care.

One workgroup discussed the specific needs of high-risk persons, who are most likely to be exposed to TB, who do not have easy access to the health care system, and who may suffer from major life difficulties or may have had prior negative experiences with the health care system. The workgroup recommended research on defining the individual and organizational barriers to the completion of treatment or preventive therapy that are specific to at-risk groups. Studies of strategies such as delivering services through "patient peers" or using alternative clinic schedules were also recommended.

The fifth group discussed increasing patient adherence. Three categories of factors were considered to influence adherence: the patient, the provider, and the system or health care structure. The workgroup agreed that standardized measures of adherence predictors and treatment completion are required so that studies at different sites can be compared. The committee recommended studies of predictors of adherence and interventions to improve adherence, such as different models of interaction between patients and providers or different approaches to directly observed therapy. They also recommended studies of interventions to improve provider compliance with recommended treatment and prevention strategies.

A proceedings from the meeting is being prepared. It will include an extensive list of workgroup recommendations for research and copies of papers that were submitted by invited speakers; it should be available in about 6 months.

—Reported by Esther Sumartojo, PhD  
Division of TB Elimination

## NEW PUBLICATIONS

### Journal Articles

Adal KA, Anglim AM, Palumbo CL, et al. The use of high-efficiency particulate air-filter respirators to protect hospital workers from tuberculosis: a cost-effectiveness analysis. *N Engl J Med.* 1994;331:169-173.

Cantwell MF, Snider DE, Cauthen GM, Onorato IM. Epidemiology of tuberculosis in the United States, 1985 through 1992. *JAMA.* 1994;272:535-539.

Driver CR, Valway SE, Morgan WM, Onorato IM, Castro KG. Transmission of *Mycobacterium tuberculosis* associated with air travel. *JAMA.* 1994;272:1031-1035.

Driver CR, Frieden TR, Bloch AB, Onorato IM. Drug resistance among tuberculosis patients, New York City, 1991 and 1992. *Public Health Rep.* 1994;109:632-636.

Kvale PA, Hansen NI, Markowitz N, et al. Routine analysis of induced sputum is not an effective strategy for screening persons infected with human immunodeficiency virus for *Mycobacterium tuberculosis* or *Pneumocystis carinii*. *Clin Infect Dis*. 1994;19:410-416.

Nettleman MD, Fredrickson M, Good NL, Hunter SA. Tuberculosis control strategies: the cost of particulate respirators. *Ann Intern Med*. 1994;121:37-40.

Passannante MR, Gallagher CT, Reichman LB. Preventive therapy for contacts of multidrug-resistant tuberculosis: a Delphi survey. *Chest*. 1994;106:431-434.

Segal-Maurer S, Kalkut GE. Environmental control of tuberculosis: continuing controversy. *Clin Infect Dis*. 1994;19:299-308.

Wolinsky E. Conventional diagnostic methods for tuberculosis. *Clin Infect Dis*. 1994;19:396-401.

Yajko DM, Nassos PS, Sanders CA, Madej JJ, Hadley WK. High predictive value of the acid-fast smear for *Mycobacterium tuberculosis* despite the high prevalence of *Mycobacterium avium* complex in respiratory specimens. *Clin Infect Dis*. 1994;19:334-336.

Zolopa AR, Hahn JA, Gorter R, et al. HIV and tuberculosis infection in San Francisco's homeless adults:

prevalence and risk factors in a representative sample. *JAMA*. 1994;272:455-461.

#### Training and Educational Materials

*Core Curriculum on Tuberculosis, 3rd Edition*. Atlanta: Centers for Disease Control and Prevention; 1994. This is a comprehensive training guide on important clinical and public health aspects of TB control. It is designed as a reference for public health professionals and TB program staff who need to know about the treatment and control of TB, as well as about screening, infection control, and community TB control. Accompanying the *Core Curriculum* is a set of slides for presentations and training courses. To order copies, call the National Center for Prevention Services Voice Information System at (404) 639-1819.

*TB Care Guide*. Atlanta: Centers for Disease Control and Prevention; 1994. The *TB Care Guide* is a small booklet on the care of TB patients. It is designed as a quick reference guide for physicians and nurses, with a tear-off reference card on regimen options and dosage calculations. The *TB Care Guide* contains all sections from the *Core Curriculum* that deal directly with case management, but it does not include information on TB program activities. This booklet was adapted for national distribution from materials developed by the New York City TB program. To order copies, call the National Center for Prevention Services Voice Information System at (404) 639-1819.

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*TB Treatment: A Clinical Guide.* Atlanta: Centers for Disease Control and Prevention; 1994. This fold-out chart contains tables on TB treatment regimens and medications and is intended for use as a reference in clinics and offices where TB patients receive care. Adapted for national distribution from materials developed by the New York City TB program, the *TB Treatment* chart is a good supplement to the information contained in the *Core Curriculum* and the *TB Care Guide*. To order copies, call the National Center for Prevention Services Voice Information System at (404) 639-1819.

*Improving Patient Adherence to Tuberculosis Treatment.* Atlanta: Centers for Disease Control and Prevention; 1994. This booklet describes strategies and perspectives for improving patient adherence to TB treatment, all geared toward the concept of providing individualized services that are sensitive to the patient's needs. To order copies, call the National Center for Prevention Services Voice Information System at (404) 639-1819.

*Questions and Answers about TB.* Atlanta: Centers for Disease Control and Prevention; 1994. This 16-page booklet, designed for TB patients, covers TB transmission, the tuberculin skin test, preventive therapy, and treatment of TB disease. To order copies, call the National Center for Prevention Services Voice Information System at (404) 639-1819.

*Stop TB!* Atlanta: Centers for Disease Control and Prevention; 1994. Intended for display in waiting rooms and clinics, this colorful poster describes TB transmission and pathogenesis. It is accompanied by a pad of tear-off sheets. To order copies, call the National Center for Prevention Services Voice Information System at (404) 639-1819.

*TB: Meeting the Challenge* [videotape]. Santa Monica, Calif: Quality Line Enterprises; 1994. Intended for health care workers, this 15-minute videotape provides basic information on multidrug-resistant TB, the purpose and use of respirator masks for TB, isolation procedures, TB transmission, TB symptoms and treatment, and tuberculin skin testing. The cost is \$199 per videotape, plus \$8 for shipping and handling (in California, add 8.25% sales tax). The videotape may be previewed for 7 working days for an \$8 shipping fee. For copies, write or call

Quality Line Enterprises  
309 Santa Monica Blvd., Suite 202  
Santa Monica, CA 90401  
(800) 356-0986

## PERSONNEL NOTES

Phyllis Cruise has been chosen for the senior public health advisor position in the Texas TB program. Phyllis has been a program consultant in DTBE since August 1992. She transferred to Austin on October 16.

Ellen Knowland has resigned from CDC and accepted a position in the Fort

Worth–Tarrant County, Texas, sexually transmitted disease (STD) program. Since June 1993, Ellen has been a public health advisor assigned to the Los Angeles TB program.

Kenneth Johnson was chosen for a first-line supervisory public health advisor position in the New York City TB program. Kenneth came to work for CDC in September 1990 in STD/HIV prevention and had assignments in Chicago and North Carolina. He joined the TB program and transferred to New York City in January 1993, where he worked as a lead outreach worker and mentor for the associates. Kenneth assumed his new duties on September 4.

John Johnson was selected for a public health advisor position in the Alabama TB program. John came to work for CDC in February 1993 as a public health associate in the New York City TB program. Previously, he was employed by the Florida health department as a disease intervention specialist in the Dade County STD/HIV prevention program. John transferred from New York to Birmingham on October 30.

Bill Rodenberger has been chosen for the senior public health advisor position in the Hawaii TB program. Since September 1991, Bill has served as a program consultant in DTBE. He transferred from Atlanta to Honolulu on October 30.

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Eugene Tamames was selected for an assignment to the Texas TB program. He will be responsible for developing and managing binational TB projects on the Texas-Mexico border. Eugene has been the senior public health advisor in the Florida TB program. He transfer from Tallahassee to San Antonio on November 13.

Paul Tribble has been selected for the senior public health advisor position in the Arizona TB program. Paul has been assigned to the Hawaii TB program since September 1988. He transferred from Honolulu to Phoenix on October 2.

Malinda West has accepted a position in the Division of Cancer Prevention, National Center for Chronic Disease Prevention and Health Promotion, CDC. Since September 1992, Malinda has been an office automation assistant in the Program Support Section, Program Services Branch, DTBE.

## CALENDAR OF EVENTS

December 5-6, 1994

**Targeting TB in Asian Pacific  
Islander Communities  
A Two-Day Skills-Building  
Conference**

**Boston, Massachusetts**

Chantal Raymer

Association of Asian Pacific Community  
Health Organizations  
(510) 272-9536

February 13-17, 1995

**Postgraduate Course on Clinical  
Management and Control of  
Tuberculosis**

**Denver, Colorado**

Catheryne J. Queen

National Jewish Center for Immunology  
and Respiratory Medicine  
(303) 398-1700

April 7-8, 1995

**Tuberculosis Then and Now  
San Francisco, California**

Department of the History of Health  
Sciences

University of California at San  
Francisco

(415) 476-2766